Amendments To The Claims

Please cancel Claims 1, 8, 10-11 and 15-38 without prejudice. The following list of the claims replaces all prior versions and lists of the claims in this application.

Claim 1 (Canceled).

2. (Currently amended) The method of ~~claim 1~~ claim 12 further comprised of forming an interfacial layer on said substrate prior to depositing said high k dielectric layer.

3. (Original) The method of claim 2 wherein the interfacial layer is comprised of silicon oxide, silicon nitride, or silicon oxynitride with a thickness between about 1 and 30 Angstroms.

4. (Currently amended) The method of ~~claim 1~~ claim 12 wherein said high k dielectric layer has a thickness from about 10 to 120 Angstroms and is comprised of ZrO_2, HfO_2, Ta_2O_5, TiO_2, Al_2O_3, Y_2O_3 La_2O_5 or is a silicate, nitride, or oxynitride of one or more of Zr, Hf, Ta, Ti, Al, Y, and La.

5. (Currently amended) The method of ~~claim 1~~ claim 12 wherein said high k dielectric layer is formed by an atomic layer deposition (ALD), chemical vapor deposition (CVD) or metal organic CVD (MOCVD) technique.

6. (Currently amended) The method of ~~claim 1~~ claim 12 wherein said high k dielectric layer ~~is comprised of ZrO_2 or HfO_2 and~~ includes one of Ta_2O_5, TiO_2, Al_2O_3, Y_2O_3 and La_2O_3 as a minor component.

7. (Currently amended) The method of ~~claim 1~~ claim 12 wherein said one or more halogen containing gases comprises CF_4, CHF_3, CH_2F_2, BCl_3, Br_2, HF, HCl, HBr, HI, NF_3 and mixtures thereof.

8. (Canceled).

9. (Currently amended) The method of ~~claim 8~~ claim 12 further comprised of adding one or more inert gases including Ar, Xe, He, and N_2 having a flow rate between about 10 and 250 sccm.

10. (Canceled).

11. (Canceled).

12. (Currently amended) ~~The method of claim 10~~ A method of removing a high k dielectric layer from a substrate, comprising the steps of:

(a) providing a substrate with isolation regions and an active area between said isolation regions;

(b) depositing a high k dielectric layer on said substrate;

(c) forming a patterned gate electrode on said high k dielectric layer; and

(d) anisotropically etching through exposed portions of said high k dielectric layer with a plasma etch comprising one or more halogen containing gases;

wherein step (d) is performed in an etch chamber and is comprised of a flow rate between about 2 and 100 standard cubic centimeters per minute (sccm) for the one or more halogen containing gases, a chamber pressure from about 4 to 80 mTorr, a RF power between about 200 and 1000 Watts, a bias power from about 20 to 500 Watts at a temperature between 20°C and 200°C for a period of about 5 to 200 seconds;

further comprised of adding one or more of O_2, CO, CO_2, and N_2O as an oxidant gas having a flow rate between about 10 and 300 sccm; and

wherein a high k dielectric layer comprising HfO_2 is etched by a method that includes a CF_4 flow rate of about 30 sccm, a CH_3F flow rate of about 60 sccm, an O_2 flow rate of about 10 sccm, a 5 mTorr chamber pressure, a RF power of about 600 Watts and a bias power of about 200 Watts for a period of about 10 seconds.

13. (Currently amended) ~~The method of claim 11~~ A method of removing a high k dielectric layer from a substrate, comprising the steps of:

(a) providing a substrate with isolation regions and an active area between said isolation regions;

(b) depositing a high k dielectric layer on said substrate;

(c) forming a patterned gate electrode on said high k dielectric layer; and

(d) anisotropically etching through exposed portions of said high k dielectric layer with a plasma etch comprising one or more halogen containing gases;

wherein step (d) is performed in an etch chamber and is comprised of a flow rate between about 2 and 100 standard cubic centimeters per minute (sccm) for the one or more halogen containing gases, a chamber pressure from about 4 to 80 mTorr, a RF power between about 200 and 1000 Watts, a bias power from about 20 to 500 Watts at a temperature between 20°C and 200°C for a period of about 5 to 200 seconds;

further comprised of adding one or more inert gases including Ar, Xe, He, and N_2 having a flow rate between about 10 and 250 sccm;

further comprised of adding one or more of O_2, CO, CO_2, and N_2O as an oxidant gas having a flow rate between about 10 and 300 sccm; and

wherein a high k dielectric layer comprising HfO_2 is etched by a method that includes a CF_4 flow rate of about 5 sccm, an O_2 flow rate of about 200 sccm, an Ar flow rate of about 100 sccm with a chamber pressure of 20 mTorr, a RF power of about 600 Watts, and a bias power of about 100 Watts for a period of about 23 seconds to end point plus an overetch period for about an additional 23 seconds beyond end point.

14. (Currently amended) The method of ~~claim 1~~ claim 12 wherein the substrate is silicon and the isolation regions are comprised of silicon oxide and the etch rate of said high k dielectric layer in step (d) is more than twice the rate of etching silicon oxide or silicon.

Claims 15-38 (Canceled).

39. (Currently amended) A method comprising:

providing a substrate;

depositing a high k dielectric layer above said substrate;

forming a patterned layer above said high k dielectric layer; and

selectively etching exposed portions of said high k dielectric layer with a plasma etch comprising one or more halogen containing gases;

wherein the selectively etching step is performed in an etch chamber and is comprised of a flow rate between about 2 and 100 standard cubic centimeters per minute (sccm) for the one or more halogen containing gases, a chamber pressure from about 4 to 80 mTorr, a RF power between about 200 and 1000 Watts, a bias power from about 20 to 500 Watts at a temperature between 20°C and 200°C for a period of about 5 to 200 seconds;

further comprised of adding one or more of O_2, CO, CO_2, and N_2O as an oxidant gas having a flow rate between about 10 and 300 sccm; and

wherein a high k dielectric layer comprising HfO_2 is etched by a method that includes a CF_4 flow rate of about 30 sccm, a CH_3F flow rate of about 60 sccm, an O_2 flow rate of about 10 sccm, a 5 mTorr chamber pressure, a RF power of about 600 Watts and a bias power of about 200 Watts for a period of about 10 seconds.

40. (Previously presented) The method of Claim 39, including:

configuring said substrate to have isolation regions, and an active area between said isolation regions;

configuring said patterned layer to be a patterned gate electrode on said high k dielectric layer; and

carrying out said selectively etching in a manner that includes anisotropically etching through said high k dielectric layer with said plasma etch.

41. (Previously presented) The method of Claim 39, including:

configuring said patterned layer to be a patterned photoresist layer;

carrying out said selectively etching in a manner that includes anisotropically etching through said high k dielectric layer with said plasma etch;

removing said photoresist;

etch transferring said pattern in said high k dielectric layer into said substrate; and

removing said high k dielectric layer with a plasma etch comprising a halogen containing gas.

42. (Previously presented) The method of Claim 39, including:

providing an interlevel dielectric (ILD) layer over said substrate before said depositing of said high k dielectric layer;

forming in said ILD layer a pattern that includes an opening with sidewalls and a bottom;

forming a first conducting layer on the sidewalls of said opening;

thereafter carrying out said depositing of said high k dielectric layer to form said high k dielectric layer on the first conducting layer;

forming a second conducting layer on said high k dielectric layer.